The morphophonology of ellipsis: evidence for Segregated Transfer*

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Abstract

This paper attempts to pinpoint the derivational timing of ellipsis by examining how it interacts with other phenomena whose timing is better understood. It is demonstrated that for morphophonological processes such as external sandhi and allomorphy, material adjacent to an ellipsis site cannot "see" ellipsis-internal material. Under the mainstream [E]-based approach to ellipsis, this result indicates that the silence characterizing ellipsis arises early at PF, consistent with non-application of Vocabulary Insertion (and inconsistent with phonological deletion). However, it would also follow straightforwardly if ellipsis sites were sent to the interfaces alone, the moment they are licensed in the syntax (Aelbrecht 2010). This approach involving the *Segregated Transfer* of ellipsis sites is pursued here: beyond the mounting syntactic evidence supporting it, it is shown to be preferable on these post-syntactic grounds as well, requiring fewer assumptions to capture these novel findings.

Keywords: ellipsis, allomorphy, external sandhi, Transfer, bleeding effects, post-syntactic operations

1 Introduction

The timing of ellipsis is generally assumed to be post-syntactic, often summed up as simply "deletion at PF". There is of course a syntactic licensing requirement that must be respected if ellipsis is to apply (Lobeck 1995); but, the received wisdom goes, most of the business of ellipsis occurs at the interfaces, where its interpretation is fixed and its silence is effected. This follows from the influential proposal in Merchant (2001) and subsequent work, in which the only ellipsis-specific syntactic mechanism is a formal feature, [E], whose effects beyond licensing are realized entirely at PF and LF. This leads to the correct prediction that, by and large, syntax proceeds as usual irrespective of ellipsis, an intuition that goes back to Ross (1969).

At the same time, the influence of Distributed Morphology has led to a more detailed view of the PF branch of the grammar in particular, viewed in such theories as a sequential derivation from abstract syntactic structure to morphological exponence providing the input for surface phonology (Halle and Marantz 1993, Embick and Noyer 2001, 2007, among others). Putting this together with the Ross-Merchant position that ellipsis sites are just normal syntactic constituents whose silence arises at PF, one might seek to ask at what point during the PF procedure this silence takes effect—i.e., when "deletion at PF" happens.[1]

One means of investigating this matter – a means which has not been sufficiently explored to this point, but which I employ here – is to probe the interactions between ellipsis and other putative PF operations, especially those whose timing within that module is better understood. For example, articulated theories of PF define stages in the post-syntactic derivation where processes involving allomorphy, external sandhi, prosody, etc. can or must take place. Examining how ellipsis interacts with such processes could shed light on its relative timing among them.

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[1] The earliest attempts to address this question from a DM-based view of PF come from Wilder (1997: §6.5) and Bartos (2000, 2001); see also Kornfeld and Saab (2004), Saab (2008), Murphy (2016), Saab and Lipták (2016), and Saab (this volume), among others. Non-DM-based approaches include that of Merchant (2001), Fox and Pesetsky (2005), and others.

The first part of this paper presents some preliminary case studies along these lines: one concerning the interaction of ellipsis and *raddoppiamento*-type sandhi in Italo-Romance (a type of external sandhi involving word-initial fortition), and one concerning the interaction of ellipsis and tone sandhi in Taiwanese (which I argue to involve allomorphy, despite its appearances as a phonological rule). With respect to such morphophonological phenomena, we see a uniform result: material surrounding the ellipsis site shows no signs of ever having "seen" the contents of the ellipsis site. This contrasts with the syntactic picture, where material outside ellipsis sites frequently exhibits connectivity to ellipsis-internal positions (e.g. operator-variable relations, agreement, etc.).

The second part of this paper explores the implications of these findings. I begin by considering their consequences for the most widely-adopted theory of ellipsis, that of Merchant (2001) and subsequent work, in which an elided XP acquires its silence only once the minimal cyclic node dominating it (which may contain additional material outside that elided XP) has been sent to PF, where "deletion at PF" can apply. Under this sort of approach, the data presented here suggest that the silence of ellipsis is relevant to the allomorph selection calculus for material adjacent to the ellipsis site, meaning the silence of ellipsis must arise no later than at Vocabulary Insertion (Bartos 2001, Kornfeld and Saab 2004, among others); it cannot be the result of a phonological deletion rule (e.g. syncope: Merchant 2004: 671), for example.

However, I conclude that the facts presented here find an even more natural explanation under the theory of ellipsis developed in Aelbrecht (2010), in which an elided XP undergoes Transfer to the interfaces, alone, at the moment it is licensed in the syntax (via Agree). I refer to this as *Segregated Transfer*. After reviewing the mounting syntactic evidence in favor of this approach, I conclude that the facts presented here provide additional post-syntactic support for the Segregated Transfer of ellipsis sites.

2 Background: "deletion at PF"

Ellipsis has for some time been thought of as "deletion at PF", especially following the influential approach in Merchant (2001, 2004, 2008): a feature, [E], is Merged on an ellipsis-licensing head (see Lobeck 1995), and satisfaction of this feature has the effect of rendering the ellipsis site silent at PF. Encoding this as a formal feature ensures that ellipsis can be made subject to syntactic licensing conditions, consistent with the empirical evidence. However, for Merchant, the satisfaction of this feature has no syntactic effect; indeed, its relevance to the syntax begins and ends with enforcing the relevant licensing configuration. Instead, the [E] feature's main job is to provide instructions to the post-syntactic modules: on the one hand, LF is instructed to ensure that conditions on recoverability/identity are met (left aside here), while PF is instructed to actually generate the silence that characterizes ellipsis—what I call its *PF signature*.

Specifically, Merchant (2004: 671) takes this PF signature to be the result of syncope, triggered by a phonological subfeatural property of [E]. As such, the ellipsis site is rendered silent purely in the phonological component of the grammar, and there is no syntactic deletion or structure removal (see fn. 7, below). On this view, the PF signature of ellipsis would arise rather late, even within the post-syntactic (PF) component: syncope rules and/or those involving the manipulation of prosodic phrases are phonological rules, and therefore take place after Vocabulary Insertion and morphological operations.[2]

There is an alternative account in the literature, however. Rather than by a phonological rule, as Merchant (2001, 2004, 2008) assumes, Wilder (1997: §6.5) and Bartos (2000, 2001) suggest that the PF signature of ellipsis arises due to non-application of Vocabulary Insertion within the ellipsis site.[3] Under the Late Insertion model assumed in Distributed Morphology (DM: Halle and Marantz 1993), syntax manipulates abstract feature bundles bereft of any phonological features; such features are not supplied until after the syntactic cycle is complete, and the post-syntactic Vocabulary Insertion procedure can apply (see Embick and Noyer 2007: §9.2.3 and Embick 2015: ch. 4 for more details on this). Under a non-insertion view of ellipsis, an elided XP is neglected by Vocabulary Insertion, earning its characteristic silence by simply failing to ever receive PF content in the first place.[4] This question of timing at PF – i.e., early non-insertion versus late phonological

[2] On the ordering of morphological vs. phonological rules at PF, see Arregi and Nevins (2012) and especially Kalin (2020).

[3] Merchant adopts this view in more recent work (see e.g. Merchant 2015: 207). For more on this approach to the PF signature of ellipsis, see Saab (this volume), and see Baltin (2012) for an alternative view.

[4] Some proponents of DM have argued that roots are unlike other morphemes in that they enter the narrow syntax with their phonological features already specified, and thus are not candidates for Vocabulary Insertion (see e.g. Embick and Noyer 2007: 296 and Embick 2015: 8). If this approach to roots in on track, then a non-insertion analysis of ellipsis is insufficient: it predicts that any

deletion – plays an important role in the next section.

Returning to Merchant's general approach, an ellipsis site is just a normal XP as far as the narrow syntax is concerned (see also Ross 1969). It undergoes Transfer to the interfaces as a normal constituent would, namely whenever the minimal cyclic node that dominates it is sent to spell-out. In other words, for Merchant, an ellipsis site arrives at PF alongside any other material external to the ellipsis site that happens to share its cyclic domain.

This contrasts with the proposal put forth in Aelbrecht (2010). Building on Merchant's [E] feature implementation, Aelbrecht argues that ellipsis is triggered during the syntax, as soon as [E] is Merged and satisfied (via Agree, potentially at a distance). Satisfaction of [E] leads to immediate Transfer of the ellipsis site – and the ellipsis site alone – to the interfaces, thus rendering it inaccessible for subsequent syntactic operations under the model of cyclicity developed in Chomsky (2001). Thus, Aelbrecht's core claim is that ellipsis can induce what are essentially *Phase Impenetrability Condition*-like (PIC) effects,[5] a property we return to later.

The distinction between these proposals regarding how an elided XP reaches PF – alongside other material as part of a bigger cyclic domain in Merchant's approach, or entirely by itself in Aelbrecht's – are important to the coming discussion. For ease of exposition, though, I adopt the mainstream Merchant-style system in the next section, where I present data involving the interaction of ellipsis and morphophonological phenomena. I comment on the implications for that approach alongside the data in the next section, before turning to Aelbrecht's proposal in §4.

Before moving on, I will comment briefly on the assumptions I make here about the syntax–phonology interface. As mentioned at the outset, the goal of this paper is to explore certain ellipsis-sandhi interactions from a broadly DM-based perspective, meaning what is adopted here is the standard DM view of PF as a sequential derivation from abstract syntactic structure through morphological exponence to, eventually, a phonological string. It is the initial portion of this derivation that will be of primary interest to us: that is, the cyclic Transfer (or spell-out) operation that brings the output of Merge from the narrow syntax into the PF component, and the PF operations that may apply while vestiges of that hierarchical information are still visible (i.e. before linearization has applied, according to standard DM assumptions; see e.g. Embick and Noyer 2007 on this particular point, and Pak 2008 for a general theory of the syntax–phonology interface grounded in DM terms). Aside from these DM-based assumptions, the general view of the syntax–phonology interface adopted here belongs to the family of analyses that Miller (2018: §2.5) refers to as *Syntactic Spell-Out Approaches*: the derivation proceeds cyclically, and the chunks that phonology deals with are defined syntactically (in the form of phases; or, to be somewhat agnostic about the precise implementation, *cyclic domains*). Note that the discussion to come makes no reference to elements of the Prosodic Hierarchy.[6] This is not to suggest that an analysis of the relevant phenomena cannot be formulated in such terms; rather, I simply take no firm stance on matters of implementation within the Syntactic Spell-Out Approach adopted here (again see Miller 2018: §2.5 for a recent survey of directions taken in the literature).

root within an ellipsis site should be pronounced, contrary to fact, since non-application of Vocabulary Insertion will have no effect on a morpheme whose phonological specification is inherent (Sailor 2021). As far as ellipsis is concerned, then, this view of roots cannot be correct if we wish to maintain a non-insertion approach to ellipsis.

[5] This is not to say that all XPs that can undergo ellipsis are independently cyclic domains/phases, or vice versa: see Aelbrecht (2010: §3.2.4).

[6] More generally, I take no firm stance on the question of whether phonology makes direct vs. indirect reference to syntactic structure (see Pak 2008: ch. 2 and Scheer 2011: §407 for an overview). For ease of exposition, I describe certain sandhi domains as being defined syntactically, recognizing that an intermediate step (e.g. the construction of prosodic domains providing subsequent input to the relevant processes) might be involved. That being said, the existing literature on the two sandhi phenomena discussed here contains empirical and conceptual arguments against purely prosodic approaches to the sandhi domains involved; I mention these where relevant, but otherwise I attempt to remain agnostic about the precise means by which morphosyntactic information is passed into phonology (aside from the assumptions common to any Syntactic Spell-Out Approach, as described above). See Scheer (2011) for extensive discussion.

3 The PF signature of ellipsis and its effects on morphophonology

Given that the characteristic silence of ellipsis arises at PF,[7] the linguist interested in the timing of ellipsis should ask how this PF signature might interact with other processes taking place within that component of the grammar. Below, I provide an initial sketch of how the PF signature of ellipsis interacts with certain morphophonological phenomena applying above the word level. This study primarily involves external sandhi: phonological changes induced across word boundaries, whose domains of application are often defined by syntactic properties such as constituency, c-command, and phase/cyclic domain boundaries. Well-known examples not discussed here include French liaison, British English intrusive /r/, Kimatuumbi vowel shortening, etc.; see Kaisse (1985: ch. 7) for an overview. Such phenomena can provide us with a novel tool for probing the PF status of an elided XP: the task is to examine the extent to which material inside an ellipsis site can participate in morphophonological processes involving material external to that ellipsis site. This can provide us with a rare glimpse into the *morphophonology of ellipsis*, a pursuit which is otherwise almost vacuous by definition.

To that end, I present data from two different types of external sandhi: one left-dominant and one right-dominant, where dominance refers to the position in the sandhi domain that induces a morphophonological alternation, but which does not undergo such a change itself.[8]

(1) *A typology of external sandhi by positional dominance*
Given underlying forms *x* and *y*, and corresponding sandhi forms *X* and *Y*,
a. Left-dominant sandhi: /x y/ → [x Y]
b. Right-dominant sandhi: /x y/ → [X y]

An example of the left-dominant sandhi comes from *raddoppiamento*-type phenomena in central and southern varieties of Italo-Romance, discussed in the next subsection. The right-dominant sandhi type is exemplified by tone sandhi in Taiwanese (Min Nan / Southern Min), which I turn to in §3.2.

3.1 Ellipsis and *raddoppiamento* sandhi in Italo-Romance

Many languages in the Italo-Romance subfamily exhibit a kind of external sandhi process involving fortition (often realized as gemination)[9] of a word-initial consonant in the context of a preceding trigger. This sandhi phenomenon is subject to significant variation across regions and varieties in Italy, both in the set of items that trigger it[10] and in the domains in which the sandhi can(not) apply (Fanciullo 1986, Loporcaro 1988, Ledgeway 2018, in press, among others).

In central Italo-Romance varieties, this sandhi phenomenon appears to be a purely phonological process requiring mere string-adjacency between a trigger and a target, such that any word-initial consonant preceded by a trigger becomes strengthened/geminated. Following the literature, I refer to this as *raddoppiamento fonologico* ('phonological doubling'; henceforth RF), and contrast it with its counterpart in southern varieties.

In the south of Italy, this sandhi process is <u>not</u> purely phonological—adjacency is a necessary condition, but not a sufficient one. Rather, it is also sensitive to locality: a word-initial consonant only undergoes gemination if the trigger preceding it is within the same minimal cyclic domain (see especially Biberauer and

[7] Assuming a strictly modular grammatical architecture in which syntax is phonology-free, the only apparent alternative would be to recast ellipsis as deletion or removal of syntactic structure: under such an approach, the elided XP would never even reach PF, leaving nothing to render silent in the first place (see Ross 1967: ch. 3 on *tree pruning*). I take structure removal to be ruled out *a priori*, but see Murphy and Müller (this volume) and references therein for an attempt at resuscitating this approach.

[8] This is an oversimplification, but one which will be sufficient for our purposes. See Zhang (2007: §1.2) for a more detailed discussion of this typology from the perspective of tone sandhi in the Sinitic languages.

[9] While gemination is a common result of this sandhi phenomenon, other kinds of initial strengthening arise as well (including changes to manner and even place of articulation of the initial consonant). For ease of reference, I will informally refer to this process simply as 'gemination' below.

[10] In the south of Italy, the set of triggers comprises mostly function words and 3SG verb forms, but also includes certain numerals (e.g. *tre* 'three') and other idiosyncrasies. In central Italian varieties (e.g. in Tuscany and Rome), the set of triggers is broader, including words with final stress (a pathway for neologisms, e.g. *twittò* 'tweet.3SG.PST'). This variation in the set of triggers is not relevant to the present discussion; in the examples below, I simply indicate the triggers with <u>underlining</u>.

D'Alessandro 2006, D'Alessandro and Scheer 2015, and Ledgeway 2018, in press). I refer to this syntactically-sensitive sandhi phenomenon as *raddoppiamento sintattico* (RS).[11]

Both types of sandhi – RF and RS – are of potential probative value for the question that presently concerns us: how does elided material interact with surrounding overt material with respect to phonological (and morphological) operations, and what can this tell us about when the PF signature of ellipsis arises in the derivation?

To begin, a simple example illustrating RF is below. (Throughout, I underline RF/RS triggers, and represent sandhi-induced gemination with **dd**oubled **cc**onsonants.)

(2) *Central Regional Italian*

a. Maria ha **dd**ue cani grandi.
Maria has two dog.M.PL big.M.PL
'Maria has two big dogs.'

b. Maria ha **tt**re **cc**ani grandi.
Maria has three dog.M.PL big.M.PL
'Maria has three big dogs.'

In (2a), the RF trigger *ha* 'has' is followed by a consonant-initial word, *due* 'two', and thus induces gemination of that consonant. The example in (2b) shows the same effect with multiple RF triggers, one of which itself undergoes gemination, arising in an RF target position.

In central varieties, this RF sandhi process operates under string adjacency at the surface level, apparently irrespective of constituency or locality. This can be shown in a variety of environments; I provide a few below. For instance, a non-restructuring verb like *odierà* 'hate.3SG.FUT' can trigger RF across a non-finite clause boundary, geminating the onset of the embedded verb (3a); a low adverbial within the scope of negation *più* 'anymore' can trigger RF both on a high, right-dislocated XP (3b), and also out of a sentential subject onto the matrix verb (3c); and, an imperative verb form – independently known to raise out of VP into the left periphery in Italo-Romance (Zanuttini 1997) – can trigger RF on its in-situ complement within VP (3d):

(3) *Central Regional Italian*

a. Maria odierà **pp**arlar=ci.
Maria hate.3SG.FUT speak.INF=CL
'Maria will hate to speak to him.'

b. Non ci va più **Cc**arlo.
NEG there go.3SG.PRES anymore Carlo
'Carlo doesn't go there anymore.'

c. Il fatto che non viene più **cc**rea problemi.
the fact that NEG come.3SG.PRES anymore create.3SG.PRES problems
'The fact that he doesn't come anymore creates problems.'

d. Fa **tt**utto!
do.2SG.IMP everything
'Do everything!'

These examples show that simple string adjacency between trigger and target is sufficient for RF to arise; syntax seems to play no role in defining the sandhi domain.

Given this property, it is perhaps unsurprising that RF has the appearance of applying after ellipsis has already taken place (i.e., to its output). Compare the form of a potential RF target when its would-be trigger is present versus when that trigger is elided (here, by nominal ellipsis):[12]

[11] The literature on these sandhi phenomena (also known as *rafforzamento (fono)sintattico*) is extensive, and I cannot do justice to it here; see Maiden (1995: 72-76) for an overview, and Ledgeway (2018, in press) and citations therein for some recent theoretical treatments. In particular, see D'Alessandro and Scheer (2015) for extensive arguments against prosodic, rather than syntactic, approaches to RS. For their helpful comments and/or judgments on the data in this subsection, I thank Valentina Colasanti, Adam Ledgeway, Shanti Ulfsbjorninn (Central Regional Italian – Tuscany), Francesca Villarosa (Central Regional Italian – Rome), and Giuseppina Silvestri (Verbicarese). Note that what I refer to as 'Central Regional Italian' is by no means a single homogeneous variety; there is considerable fine-grained variation among the many regional varieties that compose this group (both with respect to RF/RS and otherwise). I leave this aside, as it does not play a significant role in the patterns reported here.

[12] The diagnostics in Saab (2018: §22.2) confirm that such examples involve true NP ellipsis (NPE), and not a null pronominal /

(4) *Central Regional Italian*

a. Maria ha **vv**isto alcune città **pp**iccole e alcune città **gg**randi.
Maria has seen some.F.PL city.F.PL small.F.PL and some.F.PL city.F.PL big.F.PL
'Maria has seen some small cities and some big cities.'

b. Maria ha **vv**isto alcune città **pp**iccole e alcune ~~[città]~~ (*g)grandi.
Maria has seen some.F.PL city.F.PL small.F.PL and some.F.PL big.F.PL
'Maria has seen some small cities and some big (ones).'

In (4b), ellipsis of a potential trigger bleeds RF on a potential target. This follows if ellipsis takes place before RF has had a chance to apply, on the assumption adopted in this section that the elided trigger and the would-be target are sent to PF together (along with the rest of the material dominated by the minimal cyclic node; here, presumably the DP conjunct), following the general approach in Merchant (2001, 2004, 2008).

For completeness, note that this effect goes in the other direction as well. Consider the following example, where a would-be RF target is elided adjacent to another potential target:

(5) *Central Regional Italian*

a. Maria ha **vv**isto tre **cc**ani piccoli e **tt**re **cc**ani grandi.
Maria has seen three dog.M.PL small.M.PL and three dog.M.PL big.M.PL
'Maria has seen three small dogs and three big dogs.'

b. Maria ha **vv**isto tre **cc**ani piccoli e **tt**re ~~[cani]~~ **gg**randi.
Maria has seen three dog.M.PL small.M.PL and three big.M.PL
'Maria has seen three small dogs and three big (ones).'

In (5), ellipsis of a potential target actually feeds application of RF across the ellipsis site to a new target. Put differently, RF evidently does not apply vacuously to the elided nominal; rather, it must wait to apply until after ellipsis has taken place.

Thus, whether we elide an RF trigger or an RF target, this sandhi phenomenon always operates on the output of ellipsis, and not on an earlier, unelided representation. Again, though, RF in Central Regional Italian clearly applies late within PF: first, its structural description requires access to word-level stress, which in turn requires Vocabulary Insertion to have already taken place along with any stress-adjusting mechanisms in the phonology;[13] second, it completely ignores syntactic structure, which is consistent with the behavior of a late rule on the standard DM assumption that syntactic structure is only visible to the early stages of PF before Vocabulary Insertion (Embick and Noyer 2001, Arregi and Nevins 2012, among others). From the foregoing data, then, we can conclude that the PF signature of ellipsis arises before what appears to be a late phonological process—a result, but not a particularly informative one.

The result would be more informative if it were replicated in an Italo-Romance variety whose sandhi domains were bounded by syntax, since any such sensitivity to syntactic structure would implicate a morphophonological operation taking place at Vocabulary Insertion or earlier (see references above). As men-

empty noun. For instance, whereas empty nouns are generally restricted to only [+human] referents (or other general concepts such as TIME, PLACE, etc.: *ibid.*:§22.2.2.3), the silent nominals here have non-human, non-general referents (dogs, cities, etc.) whose meaning must be supplied by a linguistic antecedent, unlike empty nouns. Compare cases where NPE is blocked, e.g. backwards NPE in coordination (*ibid.*:§22.2.2.1): there, only a [+human] reading for the first conjunct is possible, as shown for Italian in (i), consistent with an empty noun. Likewise, idiosyncratic selectional properties of missing nominals (e.g. the type of PP complements they take) are preserved in putative NPE contexts (*ibid.*:§22.2.1.3), a fact which cannot be easily accommodated under an empty noun analysis (short of positing a different empty noun for each possible PP complement type); this holds in Italian, as in (ii).

(i) I tonti e i cani intelligenti sono indistinguibili.
the.M.PL foolish.M.PL and the.M.PL dog.M.PL intelligent.M.PL be.3.PL.PRES indistinguishable.M.PL
'Foolish people and smart dogs are indistinguishable.' *Empty noun reading*
#'Foolish dogs and smart dogs are indistinguishable.' *NPE reading*

(ii) La passione di Franco per la pesca e la mia per la lettura...
the.F.SG passion.F.SG of Franco for the.F.SG fishing.F.SG and the.F.SG mine.F.SG for the.F.SG reading.F.SG
'Franco's passion for fishing and mine for reading...'

[13] A common analysis of RF (originating with Repetti 1991) involves taking the triggers to bear a floating mora that gets filled by spreading of the target's initial consonant. Under such an approach, there is no RF rule, strictly speaking (and thus no structural description for such a rule), but the point here remains: the mechanism underlying RF requires access to phonological information that only becomes available once Vocabulary Insertion has taken place and the PF derivation has proceeded to the seemingly rather late stage at which the relevant phonological processes can take effect (e.g. spreading and syllabification).

tioned previously, RS in southern varieties exhibits such syntactic sensitivity. Specifically, RS in these varieties only applies when the RS trigger and its potential target are not separated by a cyclic domain boundary: in other words, RS applies only when both the trigger and the target are sent to PF together, within the same cycle. Consider the following minimal pair from the southern Italo-Romance variety Cosentino, in which the presence vs. absence of RS tracks differences in the syntactic construal of the RS triggers and their potential targets with respect to cyclic domains:

(6) *Cosentino* (Ledgeway *in press*: (11))

a. Accussì **pp**arava ccu mia.
thus speak.3SG.PAST.IND with me
'He used to speak to me like that.'

b. Accussì parava ccu mia.
thus speak.3SG.PAST.IND with me
'Therefore, he used to speak to me.'

The sentences in (6) both involve the RS trigger *accussì* 'thus', but RS is only found in (6a), not in (6b). This distinction in phonological form accompanies a distinction in interpretation: in (6b), *accussì* 'thus' can only be interpreted as a discourse connector, rather than as a topicalized manner adverbial in (6a). On the assumption that the minimal cyclic domain dominating the Cosentino verb is CP, Ledgeway (2018, in press) argues that the RS patterns in (6) demonstrate the syntactic sensitivity characteristic of RS in southern Italo-Romance varieties: whereas topics independently behave as though they are clause-internal (and thus fall within the verb's minimal cyclic domain, triggering RS), peripheral discourse connectors generally behave as though they are clause-external (and are therefore outside the minimal cyclic domain dominating the verb, thus failing to trigger RS; see also Haegeman 2012 on the central vs. peripheral distinction with respect to adverbial clauses).

Further evidence of this cyclic domain-mate condition on RS can be found in (7), in which a particular imperative verb form triggers RS on a clitic object, but not on a full DP object:

(7) *Cosentino* (Ledgeway *in press*: (12))

a. Fa **ll**u!
do.2SG.IMP it.ACC.M.SG
'Do it!'

b. Fa tuttu!
do.2SG.IMP everything
'Do everything!'

In the imperative, the Italo-Romance verb raises into a left-peripheral position; independently, enclitic objects such as *lu* 'it.ACC.M.SG' must also raise out of VP into the left periphery. The result is that the imperative verb and its clitic object come to occupy the same minimal cyclic domain, CP, and are thus Transferred together. On the other hand, full DP objects such as *tuttu* 'everything' remain within VP,[14] separated from the imperative verb by (at least) one cyclic domain boundary (see Ledgeway 2018, *in press* for details left aside here). Again, this sensitivity to locality distinguishes the RS system of southern Italo-Romance varieties from the RF system of Central Regional Italian. As an especially clear illustration of the difference, compare (7b) to (3d), repeated below, with which it forms a minimal pair:

[14] To my knowledge, QR and other so-called covert movements seem to play no role in the sandhi calculus, either here or elsewhere. That is, I know of no cases where the overt tail of a movement chain surfaces with a sandhi form due to the unpronounced head of that chain occupying a position typically targeted by a sandhi process. If this generalization is correct, then such movement configurations arising within a single cyclic domain might help shed light on the relative order of copy deletion and whatever (morpho)phonological mechanism is responsible for effecting the given sandhi type (e.g. Vocabulary Insertion, for cases where sandhi can be shown to involve allomorphy; see §3.2 below and McPherson 2019). For completeness, note that unpronounced copies of an RS trigger such as *cchi* 'what' evidently do not figure into the RS calculus either (Ledgeway 2018: 290):

(i) Cchi **bb**u ~~cchi~~ (*c)ca facimu ~~cchi~~?
what want.2SG.PRES that do.1PL.PRES
'What do you want us to do?'

Further exploration of the interaction between copy deletion and sandhi phenomena such as RS must be left for future work (but see Simpson and Wu 2002 on the interaction of movement and Taiwanese tone sandhi).

(3) *Central Regional Italian*

d. Fa **tt**utto!
do.2SG.IMP everything
'Do everything!'

This contrast underscores the core difference between a surface-phonological RF system like the one in Central Regional Italian and the RS system found throughout southern Italo-Romance varieties: in only the latter, the trigger and target must be Transferred to PF together, as part of the same cycle, for sandhi to take effect. (For further discussion, including evidence from other southern Italo-Romance varieties, see Biberauer and D'Alessandro 2006, D'Alessandro and Scheer 2015, and Ledgeway 2018, in press.)

Returning now to ellipsis, we see just the same pattern in southern varieties as we saw in central ones. That is, RS also seems to ignore ellipsis, as though it applies only after ellipsis has taken effect (shown here with Verbicarese):[15]

(8) *Verbicarese*

a. Peppə ha **bb**istə tre **kk**anə ninnə e **tt**re **kk**anə gruəssə.
Peppe has seen three dog.M.PL small.M.PL and three dog.M.PL big.M.PL
'Peppe has seen three small dogs and three big dogs.'

b. Peppə ha **bb**istə tre **kk**anə ninnə e **tt**re ~~[kanə]~~ **gg**ruəssə.
Peppe has seen three dog.M.PL small.M.PL and three big.M.PL
'Peppe has seen three small dogs and three big (ones).'

Thus, we see the same (non-)interaction between sandhi and ellipsis in southern Italo-Romance as we saw in Central Regional Italian: eliding a would-be target feeds RF/RS across the ellipsis site to another potential target (within the same minimal cyclic domain in the case of RS).

There are different ways of interpreting these findings. On one hand, the seeming sensitivity of RS to syntactic information (*qua* cyclicity) gives it the appearance of a process that must apply quite early in the PF derivation, under the standard DM assumption that syntactic information is only available up to the point of Linearization, prior to Vocabulary Insertion (Embick and Noyer 2007, among others). If that were the case, then ellipsis would necessarily take effect even earlier than this, since it has the appearance of providing the input for RS when it applies. In other words, this would suggest that ellipsis takes place no later than the very earliest stages of PF. However, alternative interpretations of these facts are available. To this point I have mostly left aside indirect reference accounts of the syntax–phonology interface (but see fn. 6), e.g. those based on the Prosodic Hierarchy; however, such approaches are, by design, able to preserve pseudo-syntactic information (in the form of prosodic constituents) throughout the PF procedure (see Selkirk 1986 and much subsequent work). As a result, relatively little could be concluded about the post-syntactic timing of a rule simply by dint of its reference to such constituents, and this remains a possibility for the facts described here. That being said, D'Alessandro and Scheer (2015) provide a number of conceptual arguments against such an approach to RS in particular, and propose instead that the difference between what I have been calling RF vs. RS is better understood as following from differences in the sizes of the chunks of structure that are sent to PF.[16] See §4 below for a proposal about the cyclic status of ellipsis sites that is compatible with D'Alessandro and Scheer's system.

We turn now to Taiwanese, whose system of tone sandhi interacts with ellipsis in a manner reminiscent of what we saw above for RS, but with one significant difference: tone sandhi in Taiwanese is not a phonological process, contrary to appearances.

[15] See Silvestri (2007, 2014) for a fuller description of RS in Verbicarese, whose sandhi system is not importantly different than that of Cosentino with respect to the matters under investigation here.

[16] In brief, a "rule" like RF/RS (cf. fn. 13) merely requires that the trigger and target share a PF cycle together. What distinguishes the two is that the appearance of syntax-blindness in RF systems can arise simply because very large chunks are being sent to PF, such that the relevant triggers and targets share a cycle together, whereas the effect of syntax-sensitive RS systems can arise just in case much smaller chunks are being sent to PF, such that would-be triggers and targets are separated from one another by a cyclic boundary (bleeding application of RS). See D'Alessandro and Scheer (2015), and further below, for additional discussion.

3.2 Ellipsis and tone sandhi in Taiwanese

Taiwanese (Southern Min), a Sinitic lexical tone language, exhibits a syntax-sensitive tone sandhi system: roughly, if a syllable bearing a lexical (*citation*) tone is in non-XP-final position,[17] it undergoes a predictable tonal alternation, surfacing with another tone instead.[18] Throughout, I **bold** syllables that have undergone sandhi (example adapted from Simpson and Wu 2002: 74):

(9) **na**-**si** **A**-sin **m**-khi, **A**-hui **ma** **b**-**e** khi.
if A-Sin NEG-go A-Hui also NEG-IMPF go
'If A-Sin doesn't go, then A-Hui also won't be going.'

Though it is evidently sensitive to syntactic structure,[19] this sandhi phenomenon necessarily arises at PF. Note, then, that it consistently seems to apply after ellipsis has taken place, akin to what we saw above with RF. Specifically, ellipsis in Taiwanese creates new XP-final configurations as far as tone sandhi is concerned. This means that a syllable which normally would have undergone sandhi in the absence of ellipsis instead arises in citation form in the presence of ellipsis.

First, consider data from Taiwanese predicate ellipsis (henceforth *VPE*), which, like English, is licensed by the highest head in the inflectional domain (i.e. the one hosting perfective/imperfective aspectual particles; see Sailor and Kuo 2010 for details):

(10) a. **A**-Ying chang **b**-**o** **khi** **hak**-hau, **tan**-**si** **A**-Ha **u** **khi** **hak**-hau.
A-Ying yesterday NEG-PERF go school but A-Ha PERF go school
'A-Ying didn't go to school yesterday, but A-Ha did go to school.'
b. **A**-Ying chang **b**-**o** **khi** **hak**-hau, **tan**-**si** **A**-Ha { u / ***u** } ~~[khi hak-hau]~~.
A-Ying yesterday NEG-PERF go school but A-Ha PERF
'A-Ying didn't go to school yesterday, but A-Ha did.'

The crucial contrast is between *u* 'PERF' in (10a) vs. (10b): in the former, *u* is in a non-XP-final position, and thus undergoes sandhi; in the latter, *u* is apparently regarded as occupying an XP-final position at the point at which tone sandhi applies, and thus must appear with its citation tone.

This effect replicates in other ellipsis environments, e.g. with nominal ellipsis, which, in this language, elides the nominal complement of a classifier:

(11) a. **Chi**-Beng **beh** **sann** **pun** chhe, **A**-Ying **beh** **si** **pun** chhe.
Chi-Beng buy three CL books, A-Ying buy four CL book
'Chi-Beng bought three books, and A-Ying bought four books.'
b. **Chi**-Beng **beh** **sann** **pun** chhe, **A**-Ying **beh** **si** { pun / ***pun** } ~~[chhe]~~.
Chi-Beng buy three CL books, A-Ying buy four CL
'Chi-Beng bought three books, and A-Ying bought four.'

In (11a), *pun* 'CL' undergoes sandhi as usual in non-XP-final position. In (11b), on the other hand, the tone sandhi calculus evidently regards the position occupied by *pun* as XP-final, and thus *pun* cannot undergo sandhi, arising instead with its citation tone.

The facts in (10) and (11) strongly suggest that ellipsis must take place before tone sandhi domains are assessed and sandhi applies, on the assumption implicit in Merchant (2001, inter alia) that an elided XP can

[17] This is an oversimplification, as adjunction complicates the characterization of the sandhi domain: essentially, the final syllable of an XP will only undergo sandhi if that XP is an adjunct. For extensive discussion of these and other complications, see Chen (2000: ch. 10); these do not bear on the present discussion, so I leave them aside. My thanks to Grace Kuo for her help with the data in this subsection.

[18] Taiwanese and Xiamen (Southern Min) tone sandhi involves circular chain shift, a type of counterfeeding opacity that is notoriously difficult to capture in both rule-based and OT-style frameworks. Neither this property nor the actual tones involved (citation or sandhi) bear on the present discussion, which is only concerned with where and when sandhi takes place; therefore, I leave discussion of them aside. See Chen (1987, 2000) and Zhang et al. (2006), among others, for extensive discussion.

[19] Note that "sensitive to" does not necessarily mean "makes direct reference to" (see fn. 6); if sandhi domains are simply a by-product of the cyclic derivation, then tone sandhi is "sensitive to syntactic structure" simply by way of working with the chunks that the syntax provides it and no more. For arguments that Taiwanese tone sandhi domains cannot be defined prosodically (and are therefore necessarily supplied by the syntax), see Chen (1987: 143) and especially Tsay and Myers (1996), who note, "Not only is [Taiwanese tone sandhi] sensitive to syntax, but it is sensitive *only* to syntax. ...[It] ignores prosodic information, such as the intonational phrases whose boundaries can be emphasized by pauses" (Tsay and Myers 1996: 399).

be sent to PF with other cycle-internal material adjacent to it such as the classifier *pun* (cf. §4).

Of course, the probative value of these facts is inherently limited by the timing of tone sandhi within the PF branch. If tone sandhi happens very late in the PF derivation, then the fact that ellipsis precedes it would tell us relatively little about when the PF signature of ellipsis takes effect. Indeed, one might assume that tone sandhi applies rather late: superficially, it seems to be a system of phonological rules manipulating lexically-specified tones, which suggests that lexical items must be present – i.e., Vocabulary Insertion must have taken place – before tone sandhi can apply. Furthermore, some studies have suggested that phonetic information plays a role in speakers' application of tone sandhi (Zhang et al. 2006); this could be taken to indicate that tone sandhi occurs near the very end of the PF procedure, at a point when surface-level phonological processes are underway. If correct, the facts above would be telling us little more than "the PF signature of ellipsis arises at some point before the very end of PF", a decidedly trivial conclusion.

However, there are reasons to believe that tone sandhi applies significantly earlier in the PF derivation than that. First, extending the logic from RF earlier, one possible conclusion that could be drawn is that tone sandhi in Taiwanese must apply early in the PF procedure on the grounds that it requires access to syntactic information (but cf. fn. 19): it must apply before such information is erased by linearization, following the logic of Embick and Noyer (2001), Arregi and Nevins (2012), and others. However, this would require allowing the mechanism(s) responsible for tone sandhi to make direct reference to syntax, which might be undesirable on grounds of modularity.

Second, and more significantly, there is substantial evidence suggesting that tone sandhi in Taiwanese (and elsewhere) is not even a phonological process at all, but rather a case of *contextual allomorphy* in the DM sense (Bobaljik 2000), which, if correct, would mean that the effects of tone sandhi arise during Vocabulary Insertion. This allomorphy-based approach to the Taiwanese tone system is proposed in Tsay and Myers (1996), but is motivated primarily on theory-internal grounds there.[20] Perhaps the most compelling argument, however, comes from the sheer non-productivity of the tone sandhi system in Taiwanese. Several nonce-word experiments in the literature have shown it to be largely unproductive: for instance, the experiment in Zhang et al. (2006) resulted in just 11.5% correct application of tone sandhi to nonce words, with the overwhelming majority (82.9%) undergoing no change in tone whatsoever, i.e. non-application. Such a high rate of non-application (vs. incorrect application) suggests that speakers simply fail to learn the system of opaque rules necessary to generate the tone sandhi system in Taiwanese; instead, they must store all sandhi and non-sandhi forms together as allomorphs. Since nonce words can have no such listed allomorphs, the especially high rate of non-application for such words follows. See Chen et al. (2010) for experimental results supporting this allomorph selection view of Taiwanese tone sandhi, and McPherson (2019) for recent extension of this approach to tone sandhi in Seenku (Mande), along with important refinements integrating this proposal into a model of cyclicity of the sort assumed here.

Taking this allomorphy-based approach to be on the right track, then, the ellipsis facts described in this section become significantly more informative: they tell us that the PF signature of ellipsis is relevant to the allomorph selection calculus. If contextual allomorphy is handled by Vocabulary Insertion, as is widely assumed in DM, then the PF signature of ellipsis must take effect no later than Vocabulary Insertion. Thus, the interaction of ellipsis and tone sandhi in Taiwanese provides clear support for a non-insertion approach to the PF signature of ellipsis (Bartos 2000, 2001, Kornfeld and Saab 2004, among others), assuming an ellipsis site can undergo Transfer with other, overt material (as implied under the general system Merchant proposes).[21]

3.3 Summary

In this section, we saw that, from a morphophonological perspective, the material surrounding an ellipsis site shows no sign of ever having "seen" the contents of that ellipsis site: it is as though the elided material were never there in the first place, at least as far as external sandhi phenomena and allomorphy are concerned. Throughout the discussion, I have assumed that an ellipsis site can be sent to PF alongside ellipsis-adjacent

[20] In brief, Taiwanese tone sandhi poses a challenge for some phonological theories that draw a strict distinction between so-called phrasal phonology on one hand and lexical phonology on the other: like many sandhi systems, it applies at the phrasal level (i.e. it is not word-bounded, since its domain of application is determined by syntax), but it nevertheless exhibits characteristics more consistent with lexical phonology (e.g. it has exceptions, it is not fully productive, etc.). See Tsay and Myers (1996) for discussion.

[21] Kornfeld and Saab (2004: 188) discuss an example from Spanish that is of a kind with the foregoing discussion of Taiwanese, in which nominal ellipsis can affect gender allomorphy on the stranded definite determiner. I leave this intriguing case aside.

material surrounding it within the same minimal cyclic domain, as implied by the original [E]-based theory of ellipsis put forward in Merchant (2001, 2004, 2008). Against this backdrop, we could take the preceding facts to indicate that the PF signature of ellipsis must arise prior to sandhi and allomorphy, at an especially early point in the post-syntactic derivation. Since allomorphy and the syntax-sensitive sandhi phenomena discussed above presumably take place at Vocabulary Insertion, this suggests that ellipsis sites are rendered silent prior to that.[22]

This is a positive result, since it would seem to constitute novel evidence pinpointing the timing of ellipsis. However, in the next section, I argue that the patterns above can also be captured using a different approach—one which does not require any ordering statements to be made about the PF operations involved, but instead exploits a component of Aelbrecht's (2010) theory of ellipsis originally intended to capture strictly narrow-syntactic facts.

4 Segregated Transfer

Recent work has reexamined the position defended in Merchant (2001, inter alia), originating with Ross (1969), that ellipsis is syntactically innocent, in the sense that it cannot interfere with the normal proceedings of that component. In particular, Aelbrecht (2010) argues that ellipsis can, under the right structural conditions, bleed phrasal movement out of the ellipsis site (see in particular her §3.3). This demands a rethinking of the timing of ellipsis: if it can bleed phrasal movement, it naturally cannot be strictly post-syntactic; it must be triggered within the same module as – and then earlier than – the movement operation it interacts with. Aelbrecht's proposal, refining Merchant's [E] feature implementation, is that ellipsis is triggered upon satisfaction of [E] (via Agree, potentially at a distance), which happens as soon as the ellipsis licensing head bearing it is Merged.[23]

Crucially, satisfaction of [E] leads to immediate Transfer of the ellipsis site to the interfaces, thus rendering it inaccessible for subsequent syntactic operations under the model of cyclicity developed in Chomsky (2001). That is, ellipsis can induce what are essentially PIC effects, accounting for limited extraction possibilities in certain structural configurations (discussed further below).[24] I refer to this component of Aelbrecht's analysis as *Segregated Transfer*: each elided XP undergoes Transfer to the interfaces alone, immediately upon satisfaction of [E], without any other material external to XP; the elided XP is thereby segregated from the rest of the syntactic derivation as soon as it is licensed.

The Segregated Transfer property of ellipsis accounts for its capacity to interfere with movement (and other syntactic operations: see below), but it also makes a previously-unnoticed prediction: ellipsis should also interfere with post-syntactic operations, namely those that would need ellipsis-internal and ellipsis-external material to be visible simultaneously within the same cycle. Segregated Transfer ensures that an elided XP never shares a post-syntactic computation with material external to XP, even if they are both contained within the same minimal cyclic domain in the syntax.

Thus, the pattern of ellipsis-morphophonology interactions I described in the previous section can be seen as directly attesting this prediction. Each disrupted PF operation discussed there needed to make simultaneous reference to ellipsis-internal and ellipsis-external material, a state of affairs prohibited by Segregated Transfer. Using the terminology from the typological description of external sandhi in (1), for a potential sandhi domain /x y/, sandhi can only apply if the PF operation(s) involved can see both /x/ and /y/ simultaneously, in context; this requires /x y/ to have been Transferred to PF together, an outcome explicitly

[22] Embick and Noyer (2001) argue that *Lowering* takes place before Vocabulary Insertion, so if the PF signature of ellipsis arises prior that, then it may actually take effect before Lowering as well (see also Harizanov and Gribanova 2019 on post-syntactic *Raising*, and *amalgamation* more generally). The results here are known to be mixed: lowering of inflection onto verbs could be thought to precede ellipsis (VPE) just in case the inflection does not originate in T. (There is an independent confound here: VPE licensing requires an overt T, so the fact that *do*-support arises when the tensed verb undergoes VPE is not dispositive.) However, the appearance of *do* in cases of British English *do*-ellipsis (Thoms and Sailor 2018) seems to point the other way, since it hosts inflection lowered onto it in the context of ellipsis. For more on the interaction of Lowering and (nominal) ellipsis, see Saab and Lipták (2016) and Murphy (2018).

[23] It is crucial to Aelbrecht's timing-based account that [E] does not wait until the end of the cycle to undergo Agree; it must happen as soon as the ellipsis licensor bearing [E] is Merged. The urgency with which this feature must be satisfied is not unique to [E]: it has been taken as a common property of features since at least Chomsky (2000), as Aelbrecht (2010: 101) notes. This has straightforward analogues in more recent theories of Agree, as well: see the FIND(f) operation of Preminger (2014: 96), for example.

[24] Despite this, Aelbrecht (2010: §3.2.4) argues convincingly for doubly-dissociating the set of elidable XPs from the set of phasal XPs.

precluded by Segregated Transfer if either /x/ or /y/ is an ellipsis site.[25]

Thus, Aelbrecht's (2010) theory of ellipsis licensing – particularly the component of it I have labeled Segregated Transfer – straightforwardly predicts the patterns we saw in the previous section, without requiring any further commitments as to the relative ordering of post-syntactic operations. This is a clear advantage over any approach to ellipsis in which ellipsis sites can be Transferred to PF alongside ellipsis-external material, such as the one assumed in Merchant (2001) and much subsequent work in the ellipsis literature. In other words, the facts presented in §3 can be taken as novel evidence from the post-syntactic component in favor of Aelbrecht's proposal. However, this evidence is only persuasive if it does not generate contradictory consequences in the other components of grammar, a crucial consideration for any cross-modular mechanism such as Segregated Transfer.

In the remainder of this section, I discuss the narrow syntactic consequences of Segregated Transfer, which, rather than being detectable by the profile of the material adjacent to the ellipsis site, instead leaves its fingerprint on the syntactic derivation by bleeding operations that seek to relate a position within the ellipsis site to one outside of it. At a sufficient level of abstraction, the post-syntactic and narrow-syntactic environments that Segregated Transfer is relevant to look the same: previously in (1), /x y/ depicted two elements within a potential sandhi domain, but we could also see /x/ and /y/ as referring to positions in the syntax, such that /x/ bears a feature whose satisfaction requires access to a position within a constituent /y/ via Agree—access which would be precluded by Segregated Transfer if /y/ were an ellipsis site whose licensor were Merged prior to probing by /x/. This is the character of the case studies in Segregated Transfer that I discuss in the remainder of this section.

I begin with the observation that motivated Aelbrecht's proposal in the first place – bleeding of phrasal movement by ellipsis – followed by two other case studies from the subsequent literature, involving bleeding of head movement and agreement, respectively. Taken together, these three cases compose a strong syntactic argument in favor of the Segregated Transfer of ellipsis sites, meaning the evidence in favor of such an approach converges from both the syntactic and post-syntactic modules.

4.1 Segregated Transfer and phrasal movement

XP-movement out of ellipsis sites is generally possible, and has been used in part to define particular ellipsis subtypes since the earliest generative treatments of ellipsis phenomena (see e.g. the initial description of sluicing in Ross 1969). Indeed, it is now widely held that ellipsis sites tolerate extraction in principle (though certain independent factors may disrupt this: see Schuyler 2001, Aelbrecht 2010, and Griffiths 2019, among others), a property which has thus been exploited as a diagnostic for distinguishing ellipsis proper from other types of null anaphora: see especially Merchant (2013: §26.2.2) for discussion and references. Simple examples illustrating XP-movement out of the site of predicate and clausal ellipsis are below, but see the preceding references for many others:

(12) I know what I like and what I don't ~~[like t_{wh}]~~.

(13) Marion will buy something, but what ~~[will Marion buy t_{wh}]~~?

Thus, syntactic operations like wh-movement can apparently proceed unhindered by ellipsis. The question is whether this is necessarily so. Is there any possible way that ellipsis could precede, and thus potentially disrupt, a syntactic operation such as phrasal movement? The answer is clearly "no" if the two are in entirely separate modules, i.e. if ellipsis were simply "deletion at PF".

We would need to find evidence of a bleeding order – that is, a configuration in which wh-movement is blocked just in case ellipsis takes place – to conclude that ellipsis has narrow-syntactic status, and that it can precede movement. The relevant test environment would be any configuration in which an XP inside an ellipsis site needs to move out, but the trigger for that movement (say, a [+wh] C head) is Merged later in

[25] One might wonder whether /x/ and /y/ could be Transferred together as part of some cyclic domain α prior to subsequent licensing of the ellipsis of /y/ (e.g.). This would allow the whole sandhi domain /x y/ to be visible at PF, allowing sandhi to apply, yielding e.g. [X y], followed by ellipsis of /y/ on a subsequent cycle (cf. Taiwanese tone sandhi: §3.2). This state of affairs is in fact ruled out by locality: for ellipsis of /y/ to be properly licensed, the [E] feature on its licensing head must not be separated from its counterpart by a cyclic node, under standard assumptions regarding the locality of Agree. For extensive discussion of local satisfaction of [E] in the narrow syntax, see Aelbrecht (2010: §3.5).

the derivation than the ellipsis licensing head. This ought to create a bleeding effect, since this XP would be trapped inside the ellipsis site (specifically, it will be inaccessible by way of having been Transferred to the interfaces) by the time the movement-inducing head is merged.

This is exactly the evidence that Aelbrecht (2010: §3.3) adduces to motivate her original proposal for (what I am calling) Segregated Transfer. The configuration arises in Dutch, and involves a type of ellipsis she refers to as Modal Complement Ellipsis (MCE) which imposes striking constraints on extraction out of its ellipsis site. In a nutshell,[26] Aelbrecht shows that an otherwise-licit instance of object wh-movement becomes unacceptable if MCE applies:

(14) *Dutch* (Aelbrecht 2010: 103)

a. Ik weet niet wie Thomas MOET uitnodigen t_{wie}, maar ik weet wel **wie** hij niet MAG
I know not who Thomas must invite but I know AFF who he not is.allowed
uitnodigen t_{wie}.
to.invite
'I don't know who Thomas HAS to invite, but I do know who he isn't ALLOWED to invite.'

b. *Ik weet niet wie Thomas MOET uitnodigen t_{wie}, maar ik weet wel **wie** hij niet MAG
I know not who Thomas must invite but I know AFF who he not is.allowed
~~[uitnodigen t_{wie}]~~.
to.invite
Intended: 'I don't know who Thomas HAS to invite, but I do know who he isn't ALLOWED to.'

Aelbrecht argues that MCE bleeds object wh-movement: specifically, the [E]-bearing ellipsis licensor is Merged prior to the trigger for wh-movement ($C_{[+wh]}$); thus, on the assumption that feature satisfaction occurs as soon as possible, ellipsis is licensed before the object wh- has the chance to evacuate the ellipsis site.

The fact that ellipsis renders the object wh- inaccessible for phrasal movement is reminiscent of the effects of the Phase Impenetrability Condition, leading Aelbrecht to propose that ellipsis licensing triggers the immediate Transfer of the ellipsis site to the interfaces—what I am calling Segregated Transfer, here. If ellipsis had not applied, the wh-phrase would have been permitted to move as normal. Moreover, Aelbrecht shows that subject wh-movement is not bled by MCE, precisely because such wh-phrases have independent motivation to evacuate the MCE site (to satisfy EPP) prior to Merger of the ellipsis licensor. Thus, there is nothing wrong with moving out of the MCE ellipsis site in principle; rather, it is the relative timing of movement being triggered vs. ellipsis being triggered that determines whether bleeding arises. Since these two operations are triggered by features on particular heads, their relative timing simply reflects their relative height in the structure, assuming a bottom-up derivation and feature satisfaction via Agree. See Aelbrecht (2010: §3.4) for detailed discussion of these facts and their analysis (including several important details left aside here).

4.2 Segregated Transfer and head movement

Extending the proposal in Aelbrecht (2010) – in which the process I have called Segregated Transfer can disrupt syntactic operations whose trigger is Merged higher than, and thus satisfied later than, the trigger for ellipsis – Sailor (2018) shows that ellipsis can disrupt head movement as well. As with phrasal movement, head movement out of an ellipsis site is possible in principle, as attested in V-stranding VPE environments such as the following:

(15) *Irish* (McCloskey 1991: 273)

Dúirt mé go gceannóinn é agus cheannaigh … ~~[$_{\text{VP}}$ $t_{\text{cheannaigh}}$ …]~~.
said I C buy.COND.1SG it and buy.PST
'I said that I would buy it and I did.' (*lit:* '…and bought.')

Again, this would follow if head movement preceded ellipsis, but also if head movement were simply not the sort of thing that could be bled by ellipsis in the first place.

However, we do see evidence of ellipsis bleeding head movement. As with phrasal movement, this arises just in case head movement is triggered later than ellipsis, a configuration that Sailor (2018) argues is attested

[26] For brevity, I am omitting certain important details here, particularly regarding the relevance of phase edges with respect to ellipsis sites in Aelbrecht's approach; see her §3.2 for discussion.

in Mainland Scandinavian. The relevant environment can be found in configurations in which the licensor of ellipsis is Merged prior to the licensor of head movement, the latter a property which can be established on ellipsis-independent grounds in these languages (Vikner 1995). Sailor argues that V-movement for verb second (V2) in Mainland Scandinavian is not triggered until C is Merged, whereas VPE is triggered upon Merge of T. This leads to the picture below, in which V-stranding VPE is bled in these languages (shown here in Norwegian), despite that they have the necessary ingredients – both V-movement out of VP, and VPE – to generate the pattern in principle:

(16) *Norwegian* (Sailor 2018: ex. (7)-(8))

a. *Johan leste ikke *Lolita*, men Marie leste.
Johan read.PAST not *Lolita*, but Marie read.PAST
Intended: 'Johan didn't read *Lolita*, but Marie did.'

b. Johan leste ikke *Lolita*, men Marie **gjorde**.
Johan read.PAST not *Lolita*, but Marie do.PAST
'Johan didn't read *Lolita*, but Marie did.'

We now recognize this as a Segregated Transfer effect: by the time C is Merged and probes the structure for the finite verb to attract, the constituent containing that verb (VP) has been rendered inaccessible, by way of having undergone Transfer to the interfaces following satisfaction of [E] on T. If ellipsis did not have this particular interface property – that is, if it were not subject to Segregated Transfer, and ellipsis sites were sent to the interfaces whenever their minimal cyclic domain were complete – then the absence of the V-stranding VPE pattern in Mainland Scandinavian would be unexplained.

The analysis proposed in Sailor (2018) has since found striking crosslinguistic support from Kashmiri (Manetta 2020). Kashmiri is also a V2 language; but, unlike Mainland Scandinavian, the finite verb undergoes movement to T independent of V2. Under Sailor's system, this predicts that Kashmiri ought to have V-stranding VPE, since V-to-T ought to bring the verb out of the ellipsis site prior to its Transfer (assuming T is the licensor of VPE in Kashmiri). As Manetta argues at length, this is exactly what we find (see her §4.2 on evidence for independent V-to-T in the language; data below from her §3.2):

(17) *Kashmiri* (Manetta 2020: (29))

A: Təm buuz zi miiraa di-yi mohn-as kitaab yaa shiil-as ciTh.
3SG.ERG hear.PERF that Mira give-FUT Mohan-DAT book or Sheila-DAT letter
'He heard that Mira will give Mohan a book or Sheila a letter.'

B: Na, miiraa di-yi nI.
No Mira give-FUT NEG
'No, Mira will not give (Mohan a book or Sheila a letter).'

The V-stranding VPE pattern in (17) is only possible in this language because Segregated Transfer is not triggered until a point in the derivation at which the finite verb has left the VP, which allows it to survive ellipsis. This is unlike the Mainland Scandinavian verb, which remains trapped in the VP until after Segregated Transfer has taken place, upon Merger of T. The key ingredient in Kashmiri syntax that generates the pattern we see above is independent V-to-T movement, which Mainland Scandinavian does not have. Thus, Kashmiri attests a prediction arising from the system in Sailor (2018), and thus provides further support for Segregated Transfer as a core mechanism of ellipsis.

4.3 Segregated Transfer and agreement

As our third case study in how Segregated Transfer can disrupt syntactic operations, we turn to the interaction of ellipsis and agreement.[27] To begin, agreement into an ellipsis site is possible in principle; for example, existentials agree with associates inside VPE sites (van Craenenbroeck 2017: 2):

(18) a. I didn't think there would be a jazz pianist at Mr. Gatsby's party, but there { was / *were }.
b. I didn't think there would be jazz pianists at Mr. Gatsby's party, but there { *was / were }.

[27] See Preminger (2014: §9.2) for many convincing arguments that agreement cannot be post-syntactic.

Ellipsis therefore does not block agreement *a priori*; certain configurations evidently allow a head outside an ellipsis site to establish an agreement relationship with a head inside that site.

However, there are also configurations that disallow just this sort of relationship, as Johnson (2015a) shows for Hocąk (Siouan). This language has obligatory object agreement on little-v with certain predicates, as in (19a). This language also has a type of "low" VPE in which little-v is stranded and filled with *do*.[28] In just such cases, object agreement on little-v becomes impossible:

(19) *Hocąk* (Johnson 2015a: ex. (14)-(15))

a. Cecil-ga nee *(hį)-hojį anąga Hunter-ga šge nee *(hį)-hojį.
Cecil-PROP me 1OBJ-hit and Hunter-PROP also me 1OBJ-hit
'Cecil hit me, and Hunter hit me too.'

b. Cecil-ga nee hį-hojį anąga Hunter-ga šge (*hį')-ųų.
Cecil-PROP me 1OBJ-hit and Hunter-PROP also 1OBJ-do
'Cecil hit me, and Hunter did too.'

Johnson argues that this is a case of ellipsis bleeding agreement. Specifically, the probing little-v fails to find a suitable goal (see Preminger 2014 on such agreement failures in non-ellipsis contexts), the predicate having been elided immediately upon satisfaction of [E].[29]

As an outcome peculiar to ellipsis, this is a Segregated Transfer effect: agreement is only bled just in case the goal has undergone ellipsis as part of a larger constituent whose Transfer to the interfaces is triggered prior to probing for agreement. A theory of ellipsis which does not appeal to Segregated Transfer would have to explain this fact – along with the other ellipsis-syntax interactions in this section, and the ellipsis-morphophonology interactions laid out in §3 – by some other means. The prospects for a unified alternative seem dim.

4.4 Summary

This section has dealt with the component of Aelbrecht's (2010) theory of ellipsis licensing that I have labeled Segregated Transfer, a consequence of the syntactic licensing of ellipsis whereby an elided XP is Transferred to the interfaces alone, without any material external to XP. After arguing that this property makes a previously-unnoticed prediction which is attested by the morphophonological phenomena laid out in §3, I reviewed arguments from the literature for Segregated Transfer from a narrow-syntactic perspective. Thus, the arguments in favor of this component of ellipsis converge across both the syntactic and post-syntactic modules.

5 Conclusion

What is the timing of ellipsis? The widespread assumption over the last two decades has been that it is licensed in the syntax, but only really takes effect at PF, following Merchant (2001). However, the nature of its silencing effect – what sort of rule it is, and when during PF it applies – has received little attention. Adopting the articulated view of PF from Distributed Morphology, I have aimed to shed light on these issues by considering the extent to which material inside an ellipsis site can interact morphophonologically with ellipsis-external material adjacent to it. The results of two novel case studies – *raddoppiamento*-type sandhi in Italo-Romance, and tone sandhi (*qua* allomorphy) in Taiwanese – show that ellipsis-internal and ellipsis-external material are not visible to each other for the purposes of morphophonological processes, despite the clear evidence that ellipsis sites contain fully articulated internal structures.

[28] This is reminiscent of *do*-ellipsis in British English (Thoms and Sailor 2018). See also Persian little-v-stranding VPE (Toosarvandani 2009, 2018, and Sailor 2009: 59-62).

[29] That these cases involve surface anaphora (i.e., non-pronunciation of articulated structure) and not deep anaphora (e.g. a silent atomic proform) is established by the availability of object extraction out of the putative ellipsis site (Johnson 2015a: §3). I leave aside several other important details here, including the arrangement of the relevant triggering features. In brief, if the position hosting object agreement / *do* is truly little-v, then [E] must be located below this position, but above the predicate ellipsis site (see Sailor 2018 for further discussion of the positioning of triggering features). This is an especially low position for [E], but nothing rules this out, particularly given the existence of the predicate ellipsis types mentioned in fn. 28. See Johnson (2015a,b) for further details on Hocąk ellipsis.

There are two ways of viewing this result. Conservatively, we can ask what the post-syntactic timing of the relevant morphophonological processes are, and use this to pinpoint when the silence of ellipsis takes effect; this is the approach taken in the first part of this paper. For example, in the case of Taiwanese tone sandhi, we see evidence that the silence of ellipsis is relevant for allomorph selection for ellipsis-adjacent material; under the DM assumption that allomorphy is handled in Vocabulary Insertion, this suggests that the silence of ellipsis arises no later than at Vocabulary Insertion. This is a positive result, since it converges on existing proposals in the recent literature (Bartos 2001, Kornfeld and Saab 2004, Saab 2008, and Saab, this volume).

However, in the second part of this paper, I argued that to stop there would be to miss a generalization: namely, that the facts presented here can be explained without reference to post-syntactic rule ordering if we take seriously the mounting syntactic evidence showing that ellipsis licensing has direct consequences on the derivational cycle. Specifically, as first proposed in Aelbrecht (2010), ellipsis licensing in the narrow syntax triggers immediate Transfer of just the ellipsis site to the interfaces, inducing effects akin to those seen under the Phase Impenetrability Condition. This property, which I label *Segregated Transfer*, is able to explain how ellipsis is capable of bleeding XP-movement, X-movement, and agreement. However, as I emphasized in the second part of this paper, it also makes a previously-unnoticed prediction: elided material should never share a PF cycle with ellipsis-external material, since the former is always Transferred alone, immediately upon being licensed. The facts presented here from Italo-Romance and Taiwanese can be seen as directly attesting this novel prediction.

In sum, we now have post-syntactic confirmation of what Aelbrecht (2010) initially proposed on strictly narrow-syntactic grounds. The timing of ellipsis therefore reduces to its licensing in the narrow syntax; its post-syntactic effects, as shown here, arise as an epiphenomenon of this licensing.

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